MULTIMEDIA UNIVERSITY

TABLE NO: | | |

STUDENT ID NO: | | | | | | | | | | |

VENUE: _____

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2019/2020

PSP0101 – PROBLEM SOLVING AND PROGRAM DESIGN

(All sections / Groups)

16 OCTOBER 2019
9.00 a.m. – 11.00 am
(2 Hours)

Question	Mark
1	
2	
3	
4	
Total:	

Examiner 1 Signature: _____

Examiner 2 Signature: _____

Examiner 3 Signature: _____

INSTRUCTIONS TO STUDENT

1. This Question paper consists of 12 printed pages (including cover page) with 4 Questions only.

2. Student must attempt **ALL QUESTIONS**. All questions carry equal marks (25 marks). The distribution of the marks for each question is given.

3. Please print all your answers **CLEARLY** in the specific answer boxes provided for each question. Submit this question paper at the end of the examination.

QUESTION 1 [25 Marks]

a) There are three types of errors a program may have. **State** the three types of errors. **Explain** each of them briefly. Provide an **example** for each of them. [9 marks]

Continued ...

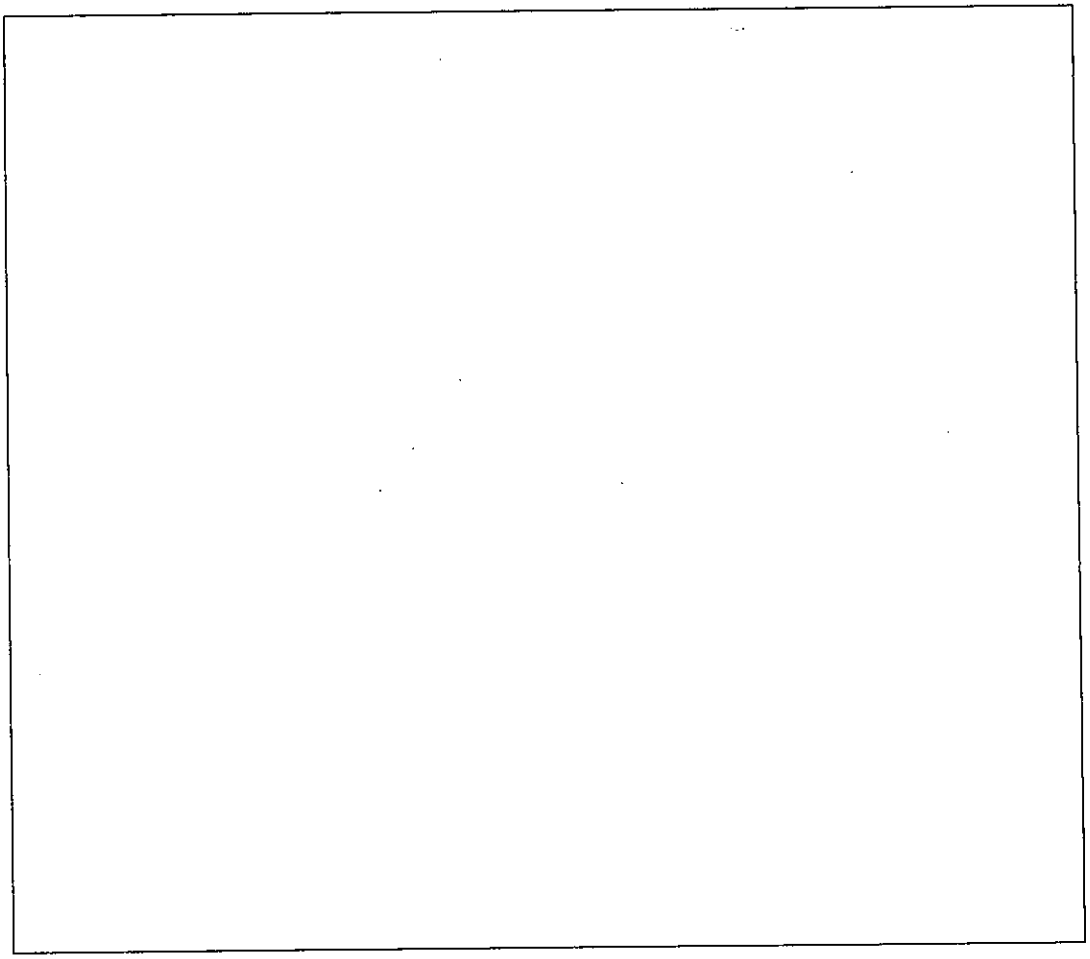
b) The addition of two fractions can be expressed as the following equation:

$$\frac{a}{b} = \frac{c}{d} + \frac{e}{f}$$

Here, a, b, c, d, e and f are all integers.

Write a Python program that accepts user input for c, d, e and f, then prints the value of a, b, and the result of dividing a by b in real number. [7 marks]

```
Sample run (user input is underlined):
Enter c: 1
Enter d: 2
Enter e: 3
Enter f: 5
Result = 11 / 10 = 1.1
```



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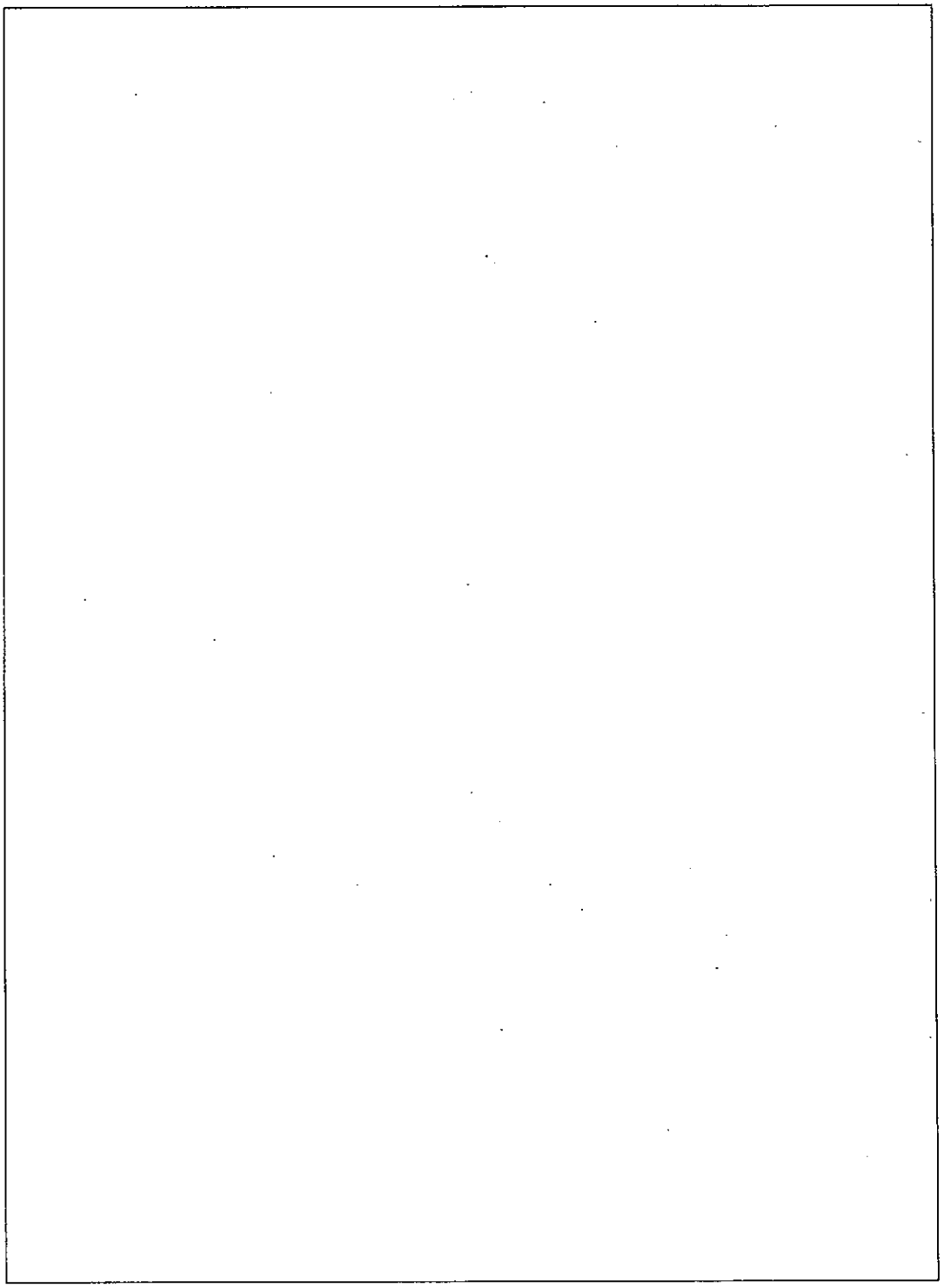
c) Draw a flowchart to print all odd numbers between two positive integers a and b (inclusive of a and b) where $a < b$. [9 marks]



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QUESTION 2 [25 Marks]

a) Write a program to calculate the perimeter of a circle, rectangle, and square. Your program first asks the user to select a shape from among circle, rectangle, and square by entering the first letter of the shape name. Then, asks the user to input the value of the variable(s) required for the perimeter calculation. For example, ask for radius if circle is selected. Lastly, print the perimeter of the selected shape. Your program shall print an error message if an invalid shape is entered. [15 marks]

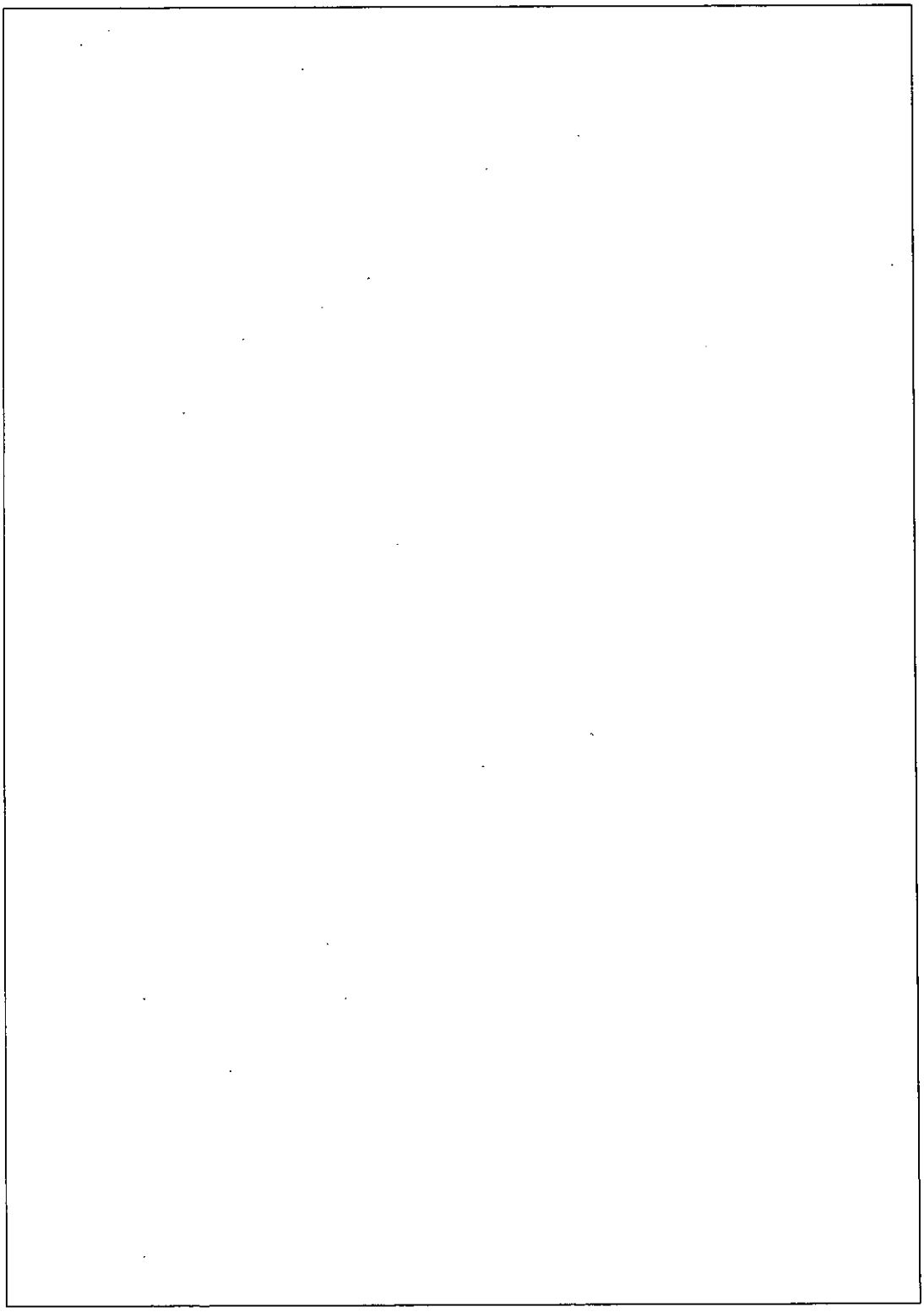
```
Sample run 1
Circle, Rectangle or Square (C/R/S): C
Enter radius: 10
Perimeter = 62.8

Sample run 2
Circle, Rectangle or Square (C/R/S): R
Enter length: 9
Enter width : 2
Perimeter = 22.0

Sample run 3
Circle, Rectangle or Square (C/R/S): S
Enter length: 7
Perimeter = 28.0

Sample run 4
Circle, Rectangle or Square (C/R/S): A
Error: Invalid shape.
```

Continued ...



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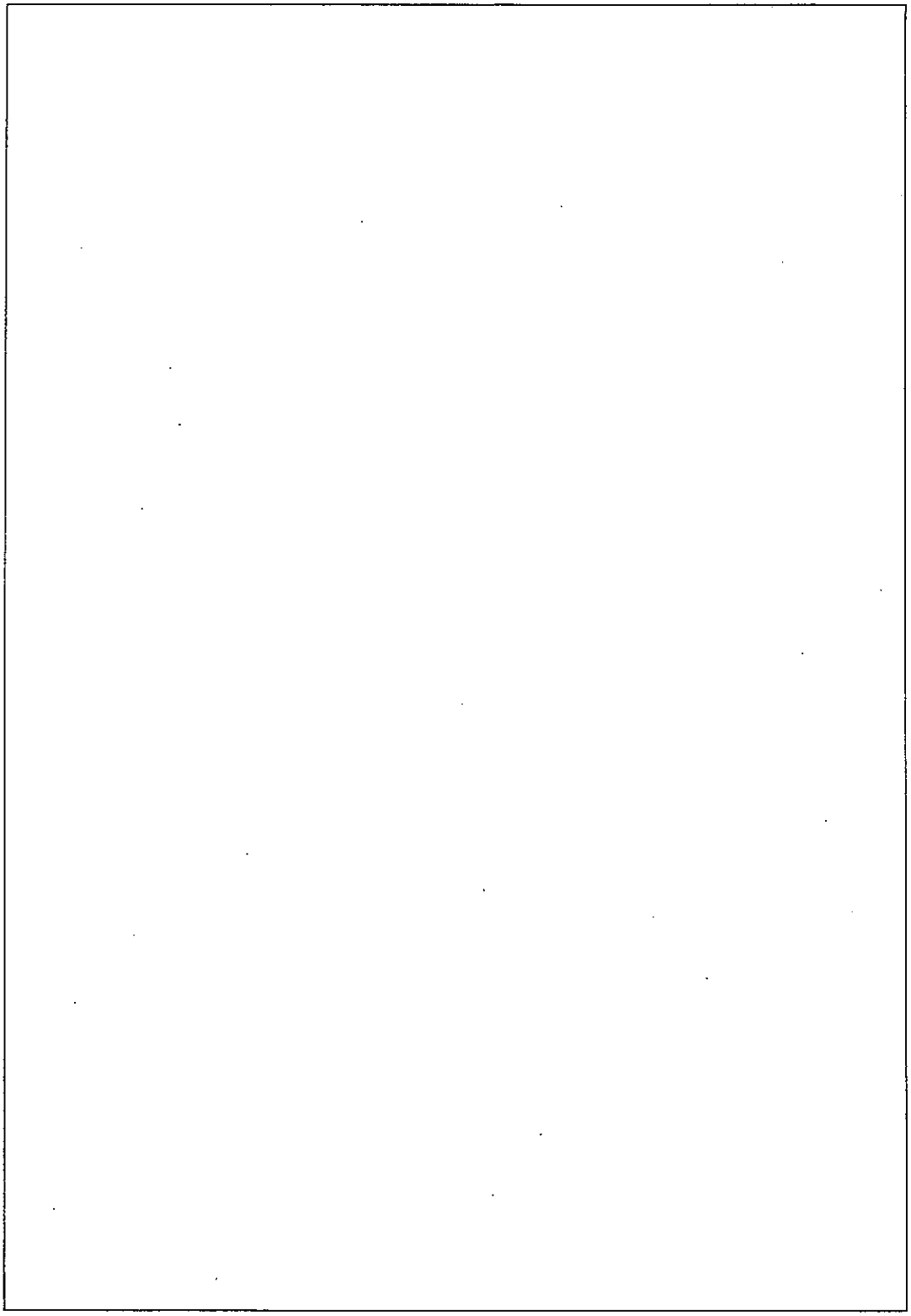
b) The Fast Shipping Company charges shipping fee based on the following rates:

Weight of Package	Rate per kg
5 kg or less	RM2.00
Over 5 kg but not more than 10 kg	RM4.00
Over 10 kg	RM6.00

For example:
If weight is 5 kg, fee is RM10.
If weight is 8 kg, fee is RM32.
If weight is 12 kg, fee is RM72.

Draw a flowchart for a program that asks user input for the weight of a package, then calculates and prints its shipping fee based on the rates in the table above.
[10 marks]

Continued ...



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QUESTION 3 [25 Marks]

a) Write a program that calculates the money entered into a parking machine. The parking fee is fixed at RM0.50 per entry. Your program shall repeatedly ask the user to enter coin or note if the total money paid is less than RM0.50. If a user pays more than RM0.50, your program shall return the balance. [11 marks]

```
Sample run 1 (user input is underlined):
Enter coin/note: RM 0.2
Total paid = RM 0.20
Enter coin/note: RM 0.2
Total paid = RM 0.40
Enter coin/note: RM 0.2
Total paid = RM 0.60
Take your ticket and balance RM 0.10

Sample run 2 (user input is underlined):
Enter coin/note: RM 0.50
Total paid = RM 0.50
Take your ticket and balance RM 0.00
```

Continued ...

b) The following list of numbers is provided.

```
7 10 45 86 50 98 75 30
```

Write a program that creates a list based on the numbers above, asks the user to provide a number to compare, then counts and sums the elements in the list that are larger than the number entered by the user. [14 marks]

```
Sample run (user input is underlined):
Enter number to compare: 50
Count of numbers larger than 50 = 3
Sum of numbers larger than 50 = 259
```

Continued ...

QUESTION 4 [25 Marks]

SimplePizza is a pizza shop that sells pizza of the same size at the same price regardless of flavours. The normal prices of a pizza are shown in the table below.

Pizza Size	Normal Price (RM)
Large	40.00
Regular	30.00

A customer who is a member enjoys a 50% discount.

Write a **complete** program that calculates the total price of pizza in a single order by a customer. Your program must define and call the following functions:

a) A function named **getOrder** which gets user input for member status, and the sizes of pizzas to order. Zero is entered to indicate the end of order. Assume the user will always input pizza size correctly therefore the function does not have to handle erroneous user inputs.
b) A function named **calcPrice** which calculates the total price of pizzas based on the member status, sizes and quantities of pizzas gathered in function getOrder.
c) A main function which calls the above two functions, then prints the total price of the pizza.

Choose your function **parameters** and **return values** adequately.

```
Sample run 1 (underline is user input):
Membercard (Y/N)  : N
Pizza size (L/R/0): L
Pizza size (L/R/0): L
Pizza size (L/R/0): R
Pizza size (L/R/0): 0
Total Price = RM 110.0

Sample run 2 (underline is user input):
Membercard (Y/N)  : Y
Pizza size (L/R/0): L
Pizza size (L/R/0): R
Pizza size (L/R/0): R
Pizza size (L/R/0): L
Pizza size (L/R/0): 0
Total Price = RM 70.0
```

[25 marks]

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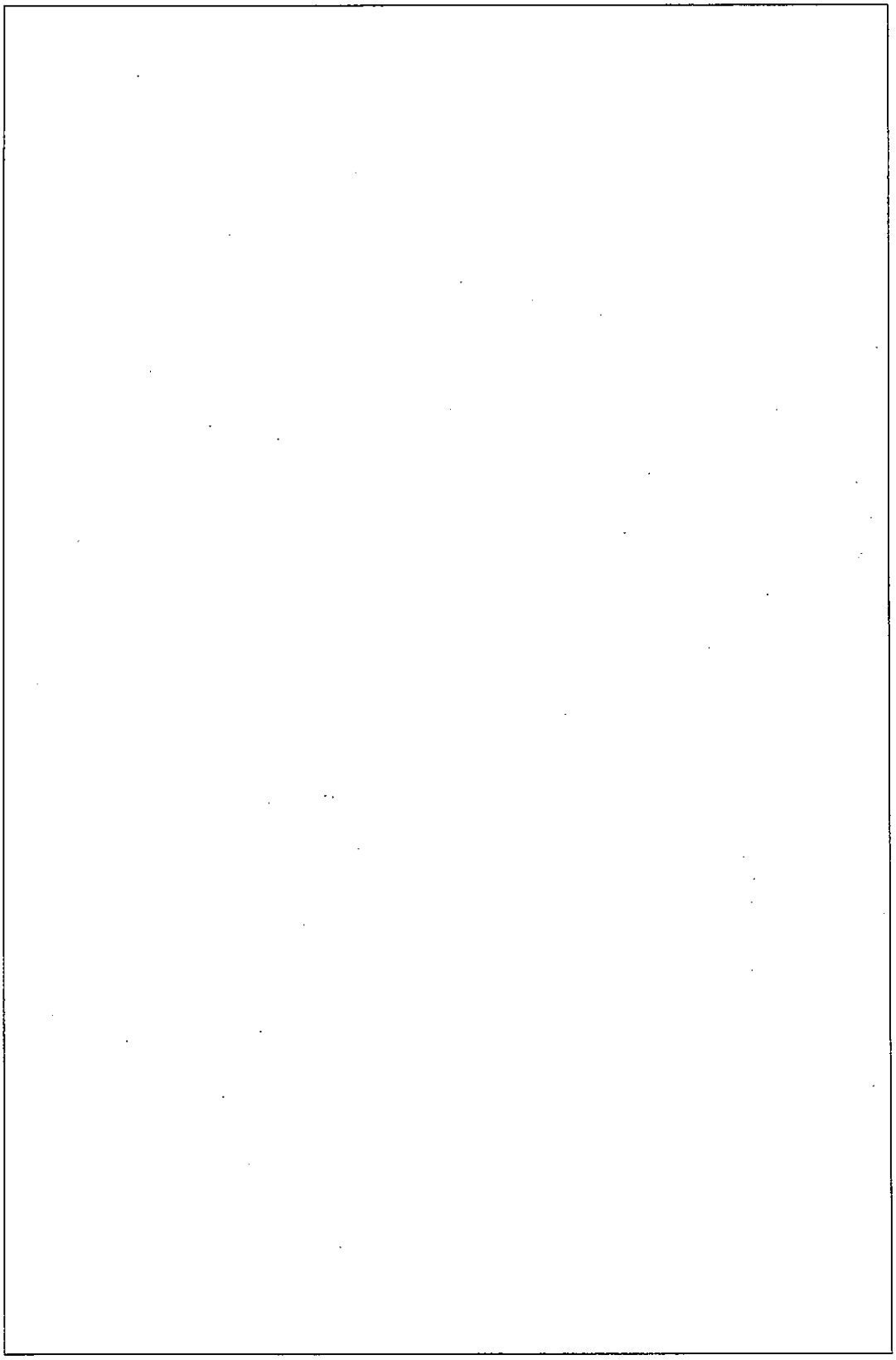

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